

	Year 7	Year 8	Year 9	Year 10	Year 11	Extension
<b>1 Finding information</b>						
<b>1.1 Using data and information sources. Learners can:</b>						
<b>1.1a</b>	use information from primary or secondary sources	use information from primary or secondary sources and know when to choose the different types	collect data systematically from sources for an identified purpose			
<b>1.1b</b>	create information from data for specific purposes and audiences, and recognise how the presentation of information can affect its validity and bias	recognise how the content and style of information can influence the message it gives and that data can be distorted and misused	synthesise information from secondary sources and understand how this can lead to bias	recognise that the types of information sources they use and how they present these has an impact on different users, and that the source should be questioned for its relevance and value		
<b>1.1c</b>	combine and refine information and data sources to answer and pose questions	justify the use of particular information sources to support an investigation or presentation, and devise and apply criteria to evaluate how well various information types support a task	create an efficient data-collection process that collects validated data	develop and justify appropriate information capture systems for others to use	evaluate and compare different information sources for relevance, clarity, usefulness, ease of use, and provenance, as part of the design and implementation of a system for others to use	evaluate in depth a range of different information sources and give fully justified reasons for the choice made for a particular purpose, taking relevance, compatibility with intended processing, and ease of understanding by user into consideration

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<b>1.2 Searching and selecting. Learners can:</b>						
<b>1.2a</b>	select information for a task from a range of sources and be aware of the relative strengths and weaknesses of these sources	select information from a range of sources and assess the potential value of the information for a task	select information for a task, using other sources to check the suitability of the information	independently select appropriate information from a wide range of sources for a specific task, taking account of their ease of use	independently select appropriate information from a wide range of sources for a specific task, taking account of their ease of use for other users	identify the range of approaches which others could take in searching and selecting information and identify the most appropriate approaches
<b>1.2b</b>	frame searches in an appropriate and considered way in relation to the required results	frame searches in an appropriate and considered way in relation to the required results, for a more complex problem	frame searches in an appropriate and considered way in relation to the required results for a more complex and unfamiliar problem	identify the advantages and limitations of different information handling applications and information sources in relation to the needs of the user	compare and contrast in detail different information handling systems in relation to their functionality and underlying technology	
<b>1.2c</b>	search for information, altering and developing the search as appropriate, checking findings for plausibility	use basic logical operators and apply these when searching for information	construct queries and complex searches to explore information for a specific purpose, such as testing a hypothesis	develop systems and files to aid others in searching for and selecting information	design, develop, document and implement an information system for others to use	identify in detail the varying needs of a range of users and the implications of these for the possible improvement of the system
<b>1.2d</b>	use search terms correctly	understand that the different ways in which search engines work can affect which information is returned	carefully consider search results and review the interpretation of data, judging its value	carefully consider search results and review the interpretation of data for other users	incorporate features to meet user needs when designing their system	incorporate the needs of all potential users into the design of their system
<b>1.2e</b>	acknowledge sources and recognise copyright	acknowledge all sources, recognising copyright and other constraints	acknowledge sources, defining primary and secondary sources, and recognise copyright and other constraints	acknowledge both primary and secondary sources and the need to obtain copyright permission	apply copyright law and acknowledge intellectual property rights, and use the correct terminology	



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<b>1.3 Organising and investigating. Learners can:</b>						
<b>1.3a</b>	save files using appropriate file names and organise files in a hierarchical folder structure	save files in appropriate formats and create a hierarchical folder structure				
<b>1.3b</b>	identify the significant data required to solve a problem	identify the essential data and ICT tools required to solve a problem				
<b>1.3c</b>	develop closed questions which will lead to specific answers in a suitable form – e.g. text, numbers – and act safely and responsibly in seeking information	develop open and closed questions with sensitivity, recognising people's cultural, social and ethical differences	use automated processing at the point of collection to gather responses efficiently using open and closed questions	develop validation within systems and understand the need for conversion of responses to make them fit to process		
<b>1.3d</b>	design a questionnaire or data-collection sheet to collect relevant data	design a questionnaire or data-collection sheet to collect relevant data, and obtain and use feedback to establish what are good questions	develop testing, including employment of user feedback, to refine existing approaches and create new ones	use the system life cycle to plan an information system, taking account of feedback at the various stages	carry out systematic analysis of user needs and incorporate this into the design, documentation, implementation and evaluation of a system for others to use	carry out systematic analysis of the needs of a range of users for a complex problem, seeking information from a range of sources
<b>1.3e</b>	recognise the structure and format of data that can support checking and correcting to remove errors after entry; recognise that data may not be plausible and that this affects results	produce or adapt a data structure, enter data into this and check that data is reasonable and accurate	produce or adapt a data structure to enhance efficiency, and enter data into this; establish a range of validation checks and visual checks to ensure a viable data set	produce a data structure to enhance efficiency; create a range of validation checks to ensure a viable data set when developing a data system, and explain the features which make it efficient	use and compare different approaches to validation in order to successfully support other users	use a comprehensive validation system to support a range of other users



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<b>1.3f</b>	generate simple queries using AND/OR operators applied to data items within fields	use more complex queries – AND, OR, NOT; use different searches to produce the most effective result or to collect extra or different data for more detailed conclusions	develop a flat-file database structure, taking into account possible ways in which the database may be interrogated	identify the link between flat-file databases, their interrogation and the overarching purpose of the investigation	develop and incorporate into the design of a system the links between the database structure, its interrogation and the overall system specification	design and develop a relational database structure, incorporating data storage efficiency, and test the strategy design against the system specification
<b>1.3g</b>	use graphs to represent information; show all key features; justify their choice of chart or graph; produce a report from the information and check the accuracy of their conclusions	represent information in graphs, charts or tables, and in a report where appropriate; justify the form of representation and check the plausibility of their conclusions	represent information in different forms and integrate information from different ICT tools to produce a solution	represent information in different forms and integrate information from different ICT tools to produce an effective solution	evaluate the effectiveness of different solutions when integrating information using different ICT tools	describe how the system could be developed to improve the efficiency of the solution
<b>1.3h</b>	consider examples of electronic databases in everyday life	identify examples of automated data collection and recognise the impact of electronic databases on learning, everyday life and employment	describe the impact of electronic databases on learning, everyday life and employment, and the potential for misuse of personal data	show an awareness of safety issues in the planning and implementation of their work	incorporate safety issues into the design documentation and implementation of a system for others to use	
<b>1.3i</b>	Check whether the ICT tools they use are appropriate for the task	evaluate different applications in terms of the structure and method of processing data	establish complex success criteria to evaluate a solution to a problem	create a specification and plan against this, documenting the process throughout	evaluate the design of their systems against the original specifications	evaluate the system against the derived success criteria and suggest non-trivial areas for development

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<b>2 Developing ideas</b>						
<b>2.1 Analysing and automating processes. Learners can:</b>						
<b>2.1a</b>	represent simple processes as diagrams to plan the task	identify the key elements of a problem and represent components in a plan	represent complex information systems in diagrammatical form to support their development			
<b>2.1b</b>	use automated processes to support consistency of style and presentation	automate simple processes by harnessing software tools; recognise where automation tools, such as filtering, can be used to improve safety when using the internet	refine existing systems and make them more efficient through automation	use automation, where appropriate, to support users of a system; recognise the benefits of planning for automation within the process of scoping a system	plan for and incorporate automated features when designing and implementing a system for others to use	originate and design automated features when developing and implementing a system for others to use



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<b>2.2 Models and modelling. Learners can:</b>						
<b>2.2a</b>	recognise the difference between data, text and formulae in a computer model and organise these so that the model is fit for purpose	combine variables within a model in different ways to form rules	extend the scope of a complex model by incorporating or changing rules	design or develop a complex model to meet a need, identifying appropriate assumptions, variables and rules	design or develop a complex model, identifying appropriate assumptions, variables and rules to meet a specific need for other users	suggest and justify in sufficient detail the structure and components required for specific models for others to construct
<b>2.2b</b>	use a model to predict an outcome	recognise that the rules contained within a model determine its output, and make more complex predictions based on several variables	refine rules (to increase validity), using information from other sources	list, describe and justify the input, process, and output characteristics of a model		
<b>2.2c</b>	explain how rules govern a model	amend existing simple models by changing variables and formulae	extend existing more complex models and create their own from a given design, reviewing efficiency	create complex models to solve a problem	compare and contrast in detail different approaches to modelling the same problem	understand the process used in industry and commerce for the development of models and start to relate these to the way they develop their own models
<b>2.2d</b>	obtain information from a model and check this for plausibility	identify whether a model has an appropriate set of variables to make it suitable for a particular purpose, and assess its accuracy by comparing its outcomes with those from other sources	check their output against that from other sources to assess the validity of the model, where appropriate	identify criteria to test whether a model is fit for purpose	design and create complex models, considering a range of approaches, as part of the design and implementation of a system	extend the design by considering the needs of different groups of users

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<b>2.3 Sequencing instructions. Learners can:</b>						
<b>2.3a</b>	rationalise a set of instructions by repeating sections	use precision and accurate syntax when framing instructions	use efficient structuring of instructions and recognise how this increases flexibility and eases testing	use variables to create increasingly complex systems	se feedback within an increasingly complex system	
<b>2.3b</b>	plan and implement sets of instructions, predicting outcomes before execution	test and refine sequences in order to achieve specific outcomes	break down a problem into manageable sections that can be represented by sub-procedures where appropriate	plan the integration of sequences of instructions with other elements to form an ICT system	plan, design and implement linked and structured sequences of instructions as part of a system for others to use	
<b>2.3c</b>		recognise that sequencing instructions is fundamental to a wide range of ICT applications	review own and others' sequences of instructions to improve efficiency			identify and communicate the key benefits and advice required to support others in developing a system



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<b>3 Communicating information</b>						
<b>3.1 Fitness for purpose. Learners can:</b>						
<b>3.1a</b>	recognise the common layouts and conventions used in different types of communication and how these address intended and familiar audience needs	plan communication projects and select the appropriate communication (type, length, media) for the intended audience (considering audience needs and expectations), purpose and environment	use an understanding of technical considerations to produce effective and efficient digital communications	produce solutions that are accessible for any user: solutions that recognise accessibility issues and apply the conventions relating to digital media	recognise and describe the impact of different formats and conventions on presentation, ease of use, ease of understanding and accessibility	consider the impact of different formats and conventions for different groups of users for whom the system might be extended or adapted
<b>3.1b</b>	recognise the limitations and opportunities of different layout formats and use these appropriately	reflect on the work of others to help plan and amend their communications and understand how effective presentations or publications address specific audience needs and expectations	use a knowledge of publications and media presentation techniques to devise complex success criteria to assess the quality and impact of communication products, and apply these criteria to their work	use feedback from the audience to inform the development of their digital communications	make their work more appropriate for a given audience by developing structured methods of capturing specific feedback and using it to refine their work	make their work more appropriate for a range of audiences, some unknown, by developing structured methods of capturing specific feedback and using it to refine their work



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<b>3.2 Refining and presenting information. Learners can:</b>						
<b>3.2a</b>	use ICT to improve their work through drafting and refining	draft, refine and structure their work using a combination of ICT tools to convey meaning more effectively				
<b>3.2b</b>	combine text, images, tables and sounds from a number of sources to convey meaning	modify and develop text, images, tables and sounds from several sources within the structure of a piece of work	refine and combine different components of text, images, tables and sounds from a range of sources			
<b>3.2c</b>	match the content and style of their work to the audience and purpose	extract, combine and modify relevant information for a specific purpose, and structure and sequence this to meet audience needs	work independently and efficiently to synthesise information from a range of sources, structuring and refining presentations for specific audiences and purposes	combine ICT tools to input, process and output information to meet the needs of a user	understand the techniques and systems needed to support information processing and communication, including the hardware and software subsystems needed to support the techniques and systems	
<b>3.2d</b>	import and export data in appropriate formats	use a range of ICT tools efficiently to refine the presentation of information for a specific purpose	identify the advantages and disadvantages of different software applications for specific purposes, and justify their choices, integrating ICT tools where appropriate	scope the range of information required to develop an automated interactive communication system	design and implement an automated interactive system for others to use	develop and refine the design and implementation of an automated, interactive system, based on feedback from different groups of users



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<b>3.3 Communicating. Learners can:</b>						
<b>3.3a</b>	capture, store and exchange information digitally by a variety of means	select appropriate methods of exchanging digital information and recognise that the format affects the method of exchange	recognise and describe the technical limitations and strengths associated with a range of digital communication methods			
<b>3.3b</b>	use digital communication to share information and collaborate with others for a purpose	use digital communications for the sharing and collaborative development of ideas for a variety of purposes	use a range of tools to automate the sharing of information and communication for a range of purposes	refine the use of tools to create an efficient communication system to facilitate collaboration	apply communication systems to facilitate collaboration and dissemination of information with a wider and possibly unknown audience, taking account of appropriate use of feedback	
<b>3.3c</b>	recognise the risks associated with the sharing of personal information digitally and to take actions to protect themselves	work in a safe and responsible way when communicating with others	be responsible, safe and secure in all communications	describe the moral, social, legal and ethical issues relating to digital communication and the sharing of information, and apply them when communicating in a responsible, safe and secure manner	exchange information securely, minimising the risks and the misuse of personal information; reflect critically on the use of digital communications, the implications for international communication and the impact on global life	support and direct organisations to develop acceptable use and safety policies that contain appropriate guidelines on exchanging and sharing information



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<b>4 Evaluating</b>						
<b>4.1 Evaluating work</b>						
<b>4.1a</b>	select ICT tools which will support the development and accuracy of their work, and learn the benefits of checking, correcting and refining their work as it progresses	improve the quality of outcomes for specific audiences and purposes by using a range of ICT tools	use ICT tools together to demonstrate a variety of outcomes, enabling the most appropriate choice of tool to be made	compare and contrast the effects on a system of combining different ICT tools in different ways	evaluate their use of ICT tools in enabling a user to interact with the system efficiently	compare and contrast existing solutions to the same problem, identifying reasons for particular approaches
<b>4.1b</b>	agree and use simple criteria, and understand how to improve their work	make and use simple success criteria that ensure fitness for purpose	devise and review complex success criteria to modify and develop their work as it progresses	devise and review complex success criteria to modify and develop their work as it progresses; pupils recognise the need to interpret end-user requirements into the system's success criteria	incorporate complex success criteria into the design and implementation of a system and amend these throughout the development of the system life cycle	outline and describe the process for the identification of detailed success criteria, to support others in developing a complex system
<b>4.1c</b>	explain the reasons for choices they have made	justify the process they use in relation to the task	evaluate the effectiveness of their approach to developing an ICT solution	consider other related tasks and problems in order to define the increasing scope of their ICT solution	carry out linked evaluations of different aspects of their work, from specification to reporting	outline and describe the testing processes required, to support others in solving a complex problem
<b>4.1d</b>	act purposefully on feedback	gather and use feedback to inform future work	gather, record and use systematic feedback from users to improve their work	plan and implement a testing regime that incorporates trials with users, and use the information gathered to refine their work in a discriminating way	apply user feedback and their own evaluations to maximise efficiency and optimise user interaction with the system	
<b>4.1e</b>	understand when to use ICT to solve a problem	reflect on their previous work and learning in order to improve their work	apply prior learning to their work	apply prior learning in their work and understand how it has improved their work	use their wide range of previous learning to help them design, develop and implement ICT systems	identify the learning required by others, to prepare them to solve a specific problem or design a system